

# 上海交通大学研究生专业课程信息收集表

## Information Form for SJTU Graduate Profession Courses

| 课程基本信息 Basic Information                        |  |                                  |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
|---|--|----------------------------------|------------------------------|---|----|------|----|---|-----------|---|---|-----------|---|---|-------------|---|---|-------|---|---|------|---|---|------|---|---|---------|---|---|--------|---|---|------------|---|
| <b>*课程名称</b><br>Course Name                     | (中文 Chinese) 凝固技术与新材料  |                                  |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
|   | (英文 English) Solidification Technology and New Materials   |                                  |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| <b>*学分</b><br>Credits                           | 3  | <b>*学时</b><br>Teaching Hours     | 48 (1 学分=16 课时)              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| <b>*开课学期</b><br>Semester                        | 春季学期 Spring  | <b>*是否跨学期</b><br>Cross-semester? | 否 No                         | 跨 Spanning over 一个学期 Semesters (含夏季学期)。 |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| <b>*课程类型</b><br>Course Type                     | 专业选修课 Program Elective Course  | <b>*课程分类</b><br>Course Type      | 全日制课程 For full-time students |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| <b>*课程性质</b><br>Course Category                 | 专业课 Specialized Course   | 课程层次<br>Targeting Students       | 博士课程 Doctoral Level          |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| <b>*授课语言</b><br>Instruction Language            | 中文 Chinese   | 主要授课方式<br>Teaching Method        | 网络教学 Online teaching         |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| <b>*成绩类型</b><br>Grade                           | 等第制 Letter grading   | 主要考核方式<br>Exam Method            | 考查 Tests                     |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| <b>*开课院系</b><br>School                          | 材料科学与工程学院 School of Materials Science and Engineering  |                                  |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| 所属学科<br>Subject                                 | 材料科学与工程 Materials Science and Engineering  |                                  |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| 负责教师<br>Person in charge                        | 姓名 Name  | 工号 ID                            | 单位 School                    | 联系方式 E-mail                             |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
|   | 王俊   |                                  | 材料学院                         | junwang@sjtu.edu.cn                     |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| 课程扩展信息 Extended Information                     |  |                                  |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| <b>*课程简介</b><br>(中文)<br>Course Description      | 课程定位：通晓凝固技术的来源与发展，掌握其背后的基本原理，构建新材料开发的凝固技术体系<br>教学目标：了解、掌握和具备探索凝固技术开发新材料的专业知识<br>教学内容：凝固原理与代表性凝固技术的发展与新材料开发<br>先修课程：凝固原理、材料成型原理   |                                  |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| <b>*课程简介</b><br>(English)<br>Course Description | Objective: To understand, master and have the professional knowledge of exploring solidification technology and developing new materials<br>Contents: solidification principle, development of representative solidification technology and development of new materials<br>Prerequisite courses: solidification principle and material forming principle  |                                  |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| <b>*教学大纲</b><br>(中文)<br>Syllabus                | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">章节</th> <th style="width: 70%;">主要内容</th> <th style="width: 20%;">课时</th> </tr> </thead> <tbody> <tr><td>1</td><td>绪论与基础知识考查</td><td>3</td></tr> <tr><td>2</td><td>金属熔体结构与处理</td><td>9</td></tr> <tr><td>3</td><td>铸造缺陷形成机制与控制</td><td>6</td></tr> <tr><td>4</td><td>半固态铸造</td><td>3</td></tr> <tr><td>5</td><td>定向凝固</td><td>6</td></tr> <tr><td>6</td><td>快速凝固</td><td>3</td></tr> <tr><td>7</td><td>微重力下的凝固</td><td>9</td></tr> <tr><td>8</td><td>高压下的凝固</td><td>6</td></tr> <tr><td>9</td><td>金属基复合材料的凝固</td><td>3</td></tr> </tbody> </table> |                                  |                              |   | 章节 | 主要内容 | 课时 | 1 | 绪论与基础知识考查 | 3 | 2 | 金属熔体结构与处理 | 9 | 3 | 铸造缺陷形成机制与控制 | 6 | 4 | 半固态铸造 | 3 | 5 | 定向凝固 | 6 | 6 | 快速凝固 | 3 | 7 | 微重力下的凝固 | 9 | 8 | 高压下的凝固 | 6 | 9 | 金属基复合材料的凝固 | 3 |
| 章节  | 主要内容   | 课时                               |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| 1   | 绪论与基础知识考查  | 3                                |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| 2   | 金属熔体结构与处理  | 9                                |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| 3   | 铸造缺陷形成机制与控制  | 6                                |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| 4   | 半固态铸造  | 3                                |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| 5   | 定向凝固   | 6                                |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| 6   | 快速凝固   | 3                                |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| 7   | 微重力下的凝固  | 9                                |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| 8   | 高压下的凝固   | 6                                |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |
| 9   | 金属基复合材料的凝固   | 3                                |                              |   |    |      |    |   |           |   |   |           |   |   |             |   |   |       |   |   |      |   |   |      |   |   |         |   |   |        |   |   |            |   |

|                                    |   |   |                |
|------------------------------------|---|---|----------------|
| *教学大纲<br>(English)<br>Syllabus     | (须与中文一致, 翻译请力求信达雅。)   |   |                |
|                                    | Chapter   | Content   | Teaching Hours |
|                                    | 1   | Introduction  | 3              |
|                                    | 2   | Metallic melt structure and treatment                   | 9              |
|                                    | 3   | The forming mechanism and controlling of casting faults | 6              |
|                                    | 4   | Semisolid casting                                       | 3              |
|                                    | 5   | Directional solidification                              | 6              |
|                                    | 6   | Rapid solidification                                    | 3              |
|                                    | 7   | Solidifying under microgravity                          | 9              |
|                                    | 8   | Solidifying under high pressure                         | 6              |
|                                    | 9   | Solidification of MMCs                                  | 3              |
| *课程要求<br>(中文)<br>Requirements      | 随堂测验、期中考查、期末考查, 要求通读相关材料与辅助文献, 熟练掌握基本原理, 能够应用所学知识分析问题、解决问题  |   |                |
| *课程要求<br>(English)<br>Requirements | In class test, mid-term test and final test. It is required to read the relevant materials and supporting documents, master the basic principles, and be able to analyze and solve problems with the knowledge learned. |   |                |
| *课程资源<br>(中文)<br>Resources         | <u>《凝固技术》、《材料学的方法论》</u>   |   |                |
| *课程资源<br>(English)<br>Resources    | <u>《solidification Technologies》、《Methodology of Materialogy》</u>   |   |                |
| 备注<br>Note                         |   |   |                |